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**Title of the Invention: Method for Packing Compressible and Elastic
Objects**

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Method for Packing Compressible and Elastic Objects

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A search request has been filed according to § 28a of the Patent Law

Documents to be considered for evaluation of patentability:

DT-AS 1 233 772

FR-AS 2 065 250

US-PS 3 389 529

US-PS 3 541 752

BE-PS 705 370

BE-PS 725 876

Method for Packing Compressible and Elastic objects

Difficulties are known to occur in the transport of relatively light objects that consist of porous cell-like material or synthetic fiber layers, because of their large dimensions.

If these objects are compressible and elastic, which is the case especially with open pores or objects consisting of synthetic fiber layers, these dimensions can be reduced by blocking these objects in a compressed position in the interior of a tight enclosure, which prevents reentry of atmospheric air into the pores.

The object of the invention is a method for packing elastic and compressible objects made of a porous or cell-like material, which is applicable, in particular, to cushions or mattresses that consist of synthetic fiber layers, and with which the thickness of these objects can be reduced by previous compression, so that several similar elements can be placed one above the other in the interior of the same package, or these individual elements can be rolled, being blocked in the interior of an air-tight enclosure in the compressed state.

In particular, many cushions or many mattresses can be provided with a covering that generally consists of a mesh or knit material that is permeable to through air and therefore permits air situated in the mentioned pores to be pressed out during compression of the cushions.

The method according to the invention, apart from the use of a press for flat pressing of these objects, consists of the fact that a bag, made from a thin plastic skin, is used, which consists of an upper and a lower sheet, between which the objects are arranged, and which can be fully joined firmly to each other in known fashion by tight sealing, after the air present in the pores of the expanded material has been pressed out beforehand, so that only an extremely limited

amount of air remains in the interior of the bag, whose absorption by the expanded material can only cause negligible inflation relative to the smallest thickness of these objects, which is achieved during the action of the press on these objects

The welding electrodes can be distributed over the entire periphery of the piston of the press used, and they can also be operated automatically, so that they are moved down in the lower position of this piston into the vicinity of an elevation extending over the periphery, which forms a counter-electrode for sealing the two sheets.

Sealing conducted after compression can also be localized on one of the sides of this piston, if covering of the object to be compressed later is facilitated with this bag by sealing performed beforehand on two or three sides of, say, a rectangular bag.

For better understanding of the features of the invention, a practical example of the method according to the invention is described below, in which the accompanying drawing is referred to. In the drawing:

Fig. 1 shows a vertical section, showing the corresponding positions of two plastic sheets that form the bag for packing an elastic cushion made of synthetic fiber layers or synthetic fiber fleece, which is covered with a covering of a porous, air-permeable fabric and is illustrated before compression.

Fig. 2 shows a section corresponding to Fig. 1, showing compression of the cushion and the sheets before welding for tight sealing of this bag.

Fig. 3 shows a section corresponding to Fig. 2, in which the electrodes surrounding the piston of the press are situated in the lower position and carry out tight sealing of the bag.

Fig. 4 shows a section through the packing bag and the compressed object contained in it after removal from the press.

As shown in Fig. 1, the press consists of a plate, provided on its periphery with an elevation 1a, and a piston 2. Between this plate and the piston, two thin sheets 3 and 6, made of plastic, which are usually transparent, and a cushion 4 are provided, which is provided with a porous, air-permeable covering 5. This cushion 4 undergoes the effect of the piston 2 moved downward into position 2a (Fig. 2) and acquires a flat shape, which is shown with 4a in Fig. 2. The simultaneously deformed covering 5 is shown with 5a and sheet 6 with 6a (Fig. 2).

The welding electrodes distributed on the periphery of piston 2 are shown in the same position with reference to the bottom 2b of piston 2. These electrodes 7 are also shown in Fig. 3 with 7a in the lower position, in which they permit sealing of sheets 3 and 6a.

Fig. 4 shows the compressed cushion 4a between the two sheets 3 and 6a, forming the packaging bag, which are sealed, especially on two parallel lines 8 (Fig. 3 and 4).

The air enclosed at the time of sealing of the bag is absorbed by the cushion contained in it, which explains why the two sheets 3 and 6a in Fig. 4 are separated from each other by a smaller distance than in Fig. 3.

The minimal increase in thickness of cushion 4 that results from this, however, is negligible and not recognizable in the drawing.

The method according to the invention for packing objects made of porous, compressible and elastic material consists of flat pressing with a press and subsequent welding process that permits inclusion of these objects in the interior of a tight bag that contains only a negligible amount of air.

This method is applicable, in particular, to packing of mattresses and cushions made of foam rubber or expanded plastic.

Patent claims

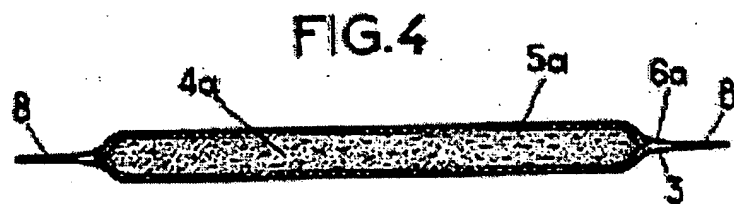
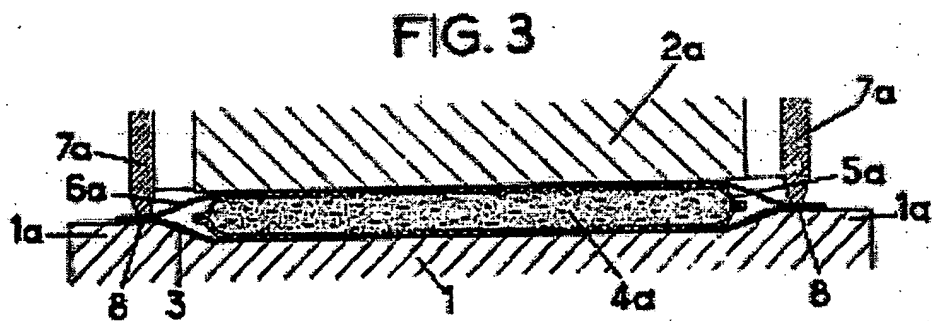
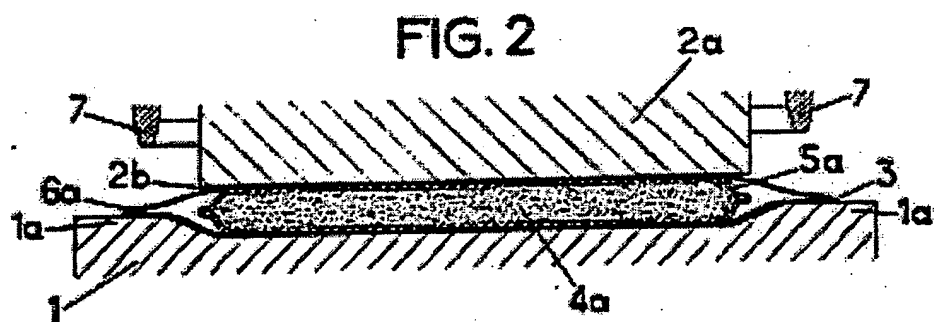
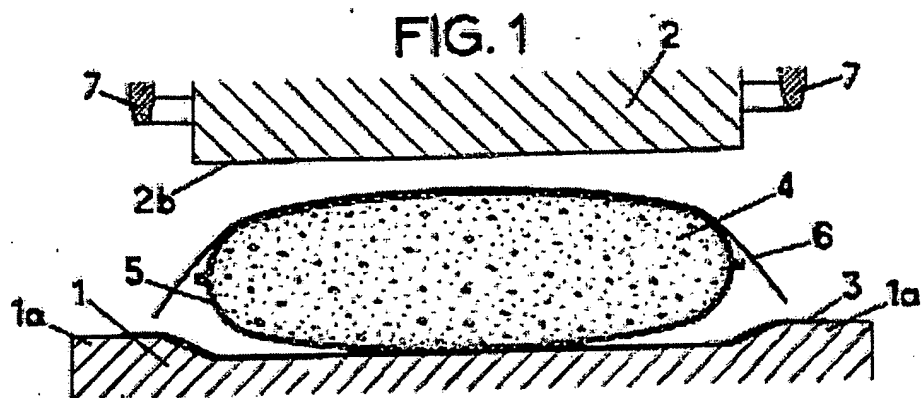
1. A method for packing compressible and elastic objects made of porous material or synthetic fiber layers, characterized in that these objects are exposed to the effect of a press, so that they are pressed flat and the air situated in the pores of the material forming them is forced out, after two, preferably transparent thin sheets of plastic have been arranged beneath and above these objects between a plate of appropriate shape and a compression piston of flat shape, which can be joined to each other on the periphery of these objects by welding, so that they form a tight bag, and that after flat pressing of these objects to minimum thickness, which corresponds to forcing out of virtually all the air contained in the pores, the electrodes surrounding the piston of the press provided on the periphery are moved downward manually or automatically, in order to join these plastic sheets tightly by welding, the electrodes being arranged close enough to the periphery of the piston of the press and to the periphery of the objects, that in the interior of this tight bag, an amount of air is enclosed that is so limited, that its absorption by the elastic porous material under the influence of elasticity of this material after upward movement of the piston of the press and the welding electrodes causes only minimal inflation of the objects and, in contrast, attempts to force the two sheets against each other in the limited space that separates the periphery of the objects from the peripheral welding lines of the bag.
2. A method according to Claim 1, characterized in that the compressible and elastic objects are covered with a textile covering that follows the upward movement of the piston of the press, both during flat pressing of the objects and during absorption of the limited amount of air provided on the periphery, which allows the air contained in the porous material to pass through.
3. A method according to one of the Claims 1 and 2, characterized in that to form the two thin sheets, a sheet folded along a line parallel to one of the sides of an object of rectangular shape is used, and that the welding electrodes are provided on the other three sides of this rectangular object.

4. A method according to one of the Claims 1 and 2, characterized in that two sheets are used independently of each other and the welding electrodes are provided on the four sides of a rectangular bag.

5. A method according to one of the Claims 1 and 2, characterized in that initially the object being packed is inserted into a bag, which was tightly welded beforehand almost over the entire periphery of the object, and that a welding electrode is used that is restricted to the unwelded part of this tight bag.

6. A method according to one of the Claims 1 to 5, characterized in that an elevation extending over the periphery is provided on the plate of the press, whose height is essentially equal to half the thickness of the objects in the compressed state, and which serves as a welding counter-electrode and can be restricted to the location of the welding electrodes.

7. A method according to one of the Claims 1 and 2, characterized in that for formation of a round bag, two sheets independent of each other are used, which are welded by means of an annular electrode extending over the periphery, which cooperates with an elevation of the same shape, which is provided on the plate of a press and forms a welding counter-electrode.



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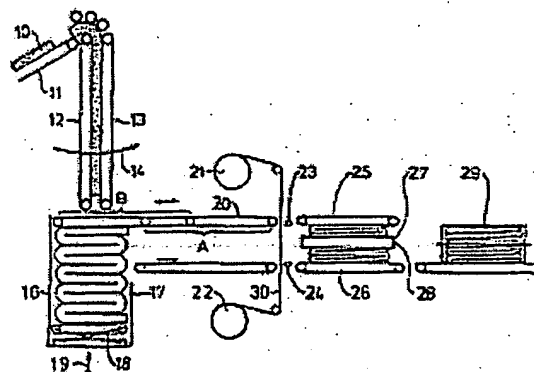
Mineral wool container and method for its manufacture

Patent number: DE3444897
Publication date: 1986-06-12
Inventor: RULAND DIETER (DE); NEUBECK KARL-HEINZ DIPL ING (DE); PETERS JUERGEN DIPL ING (DE); CHALUPKA GEORG DIPL ING (DE)
Applicant: BAYER AG (DE)
Classification:
- **International:** B65B63/04; B65D85/16; B65B63/00; B65D85/16; (IPC1-7): B65D85/16; B65B25/00; F16L59/00
- **European:** B65B63/04; B65D85/16
Application number: DE19843444897 19841208
Priority number(s): DE19843444897 19841208

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Abstract of DE3444897

The mineral wool container consists of a mineral wool mat (1) folded in a zigzag manner and an outer endless film (2) which guarantees that it is held together. The mineral wool (1) is held inside the film (2) under a compression pressure at a quarter to a tenth of its volume under atmospheric pressure. Under these conditions, the mineral wool container has a volume weight of between 60 and 180 kg/m³. The mineral wool container is manufactured in such a way that the mineral wool mat (1) is placed in a pendulum fashion in zigzag folding vertically in a rectangular container (15) whose bottom (18) is formed from a stationary conveyor belt, the container (15) is covered by another laterally movable conveyor belt (20) and the folded mat (10) is welded into a film (2, 31), if appropriate after compression.






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Method and device for packaging.

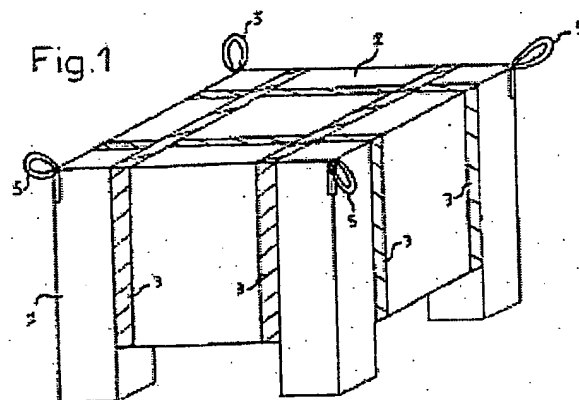
Patent number: DE69310454T
Publication date: 1997-11-27
Inventor: PIVOTEAU JEAN (FR); MOSNIER PATRICK (FR)
Applicant: VETROTEX FRANCE SA (FR)
Classification:
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- european: B65D88/16F
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Priority number(s): FR19920009082 19920723

Also published as:

 EP0580516 (A1)
 FR2693980 (A1)
 EP0580516 (B1)

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Abstract not available for DE69310454T
Abstract of corresponding document: **EP0580516**
The invention relates to a method for packaging a solid substance in the divided state. It applies, in particular, to the packaging of cut glass fibres. According to the invention, this method gives rise to a packaging permitting the transportation of this substance without the addition of a supplementary element acting as an interface between the package and the transporter. The invention also proposes a container permitting the transportation of this type of substance without a supplementary element.



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